

**BOARD FOR PROFESSIONAL ENGINEERS, LAND SURVEYORS, AND GEOLOGISTS**

2535 Capitol Oaks Drive, Suite 300, Sacramento, California, 95833-2944

Telephone: (916) 263-2222 – Toll Free: 1-866-780-5370

Facsimile: (916) 263-2246

www.pels.ca.gov & www.geology.ca.gov

**Definitions of Critical Concepts for the Professional Geologist, Professional Geophysicist, Certified Engineering Geologist, and Certified Hydrogeologist Application Process:**

Earth Science - An all-embracing term for sciences related the Earth (analogous, in educational parlance, to "life science"). It is occasionally used as a synonym for *geology* or *geological sciences*, but its usage is misleading because in its wider scope, earth science may be considered to include such subjects as meteorology, physical oceanography, soil chemistry, and agronomy. CF: *Geological Sciences* ("Glossary of Geology, 4th Edition", American Geological Institute, 1997, page 199).

Geology - The science which treats of the earth in general; investigation of the earth's crust and the rocks and other materials that compose it; and the applied science of utilizing knowledge of the earth and its constituent rocks, minerals, liquids, gases and other materials for the benefit of mankind.

Geological Sciences - Any of the subsidiary specialties that are part of the science of *geology*; e.g., geophysics, geochemistry, paleontology, petrology, etc. CF: *Earth Science* ("Glossary of Geology, 4th Edition", American Geological Institute, 1997, page 265).

Engineering Geology - The application of geologic data, principles and interpretation so that geologic factors affecting planning, design, construction and maintenance of civil engineering works are properly recognized and utilized.

Hydrogeology - The application of the science of geology to the study of the occurrence, distribution, quantity and movement of water below the surface of the earth, as it relates to the interrelationships of geologic materials and processes with water, with particular emphasis given to groundwater quality.

Geophysics - The science which involves study of the physical earth by means of measuring its natural and induced fields of force, including, but not limited to, electric, gravity, and magnetic, and its responses to natural and induced energy and the interpreting of these measurements and the relating of them to the physics of the earth.

Physical Geology - A broad division of geology that concerns itself with the processes and forces involved in the inorganic evolution of the Earth and its morphology, and its constituent minerals, rocks, magmas and core materials ("Glossary of Geology, 4th Edition", American Geological Institute, 1997, page 485).

Professional Geologic Work - Work performed at a professional level rather than at a subprofessional or apprentice level and requires the application of scientific knowledge, principles and methods of geological problems through the exercise of individual initiative and judgment in investigating, measuring, interpreting and reporting on the physical phenomena of the earth. Implicit in this definition is the recognition of professional responsibility and integrity and the acknowledgement of minimal supervision.

Professional geologic work specifically does not include: routine activities such as drafting, sampling, sample preparation, routine laboratory work, etc., where the elements of initiative, scientific judgment and decision making are lacking, activities that do not use scientific methods to process and interpret geologic data, soils engineering, soils sampling, soils testing or other activities in or related to the agricultural application of soils sciences, and mining, mining engineering or other engineering disciplines and/or other physical sciences wherein geological investigation, analysis and interpretation are minimal or lacking.

Professional Geophysical work - Work performed at a professional level rather than at a sub-professional or apprentice level and requires the application of scientific knowledge, principles and methods to geophysical problems through the exercise of individual initiative and judgment in investigating, measuring, interpreting and reporting on the physical phenomena of the earth. Implicit in this definition is the recognition of professional responsibility and integrity and the acknowledgment of minimal supervision.

Professional geophysical work specifically does not include activities wherein the analysis or interpretation of geophysical or geological information is lacking. Such nonprofessional work could encompass party or crew chief and would encompass lesser forms of employment in field parties, the manufacture, assembly or maintenance and repair of geophysical instruments and equipment, computer programming, data processing or retrieval and routine activities normally performed by a technician in acquiring and reporting on geophysical information where the elements of initiative, scientific judgment and decision making are absent. It also does not include those engineering disciplines and other physical sciences wherein geophysical or geological investigation, analysis and interpretation are minimal or lacking.

Education requirements:

Professional Geologist - Graduation with a major in *geological sciences* from college or university. The Board requires transcript(s) from each of the applicant's college or university attended. The applicant must request a certified copy of the transcript be mailed to the Board. Transcript(s) submitted by the applicant will not be accepted. Each year of undergraduate study in the geological sciences shall count as one-half year of training up to a maximum of two years_and each year of graduate study or research counts as a year of training. Teaching in the *geological sciences* at college level shall be credited year for year toward meeting the requirement in this category, provided that total teaching experience includes six semester units per semester or equivalent if on the quarter system, of upper division or graduate courses. Credit for undergraduate study, graduate study, and teaching, individually, or in any combination thereof, shall in no case exceed a total of three years towards meeting the requirement of at least five years of professional geological work as set forth above. A maximum of 36 months of credit will be applied to any application.

Professional Geophysicist - Graduation with a major in a *geophysical science* from a college or university. The Board requires transcript(s) from each of the applicant's college or university attended. The applicant must request a certified copy of the transcript be mailed to the Board. Transcript(s) submitted by the applicant will not be accepted. Each year of undergraduate study in the geophysical science shall count as one-half year of training up to a maximum of two years_and each year of graduate study or research counts as a year of training. Teaching in the *geophysical sciences* at college level shall be credited year for year toward meeting the requirement in this category, provided that total teaching experience includes six semester units per semester or equivalent if on the quarter system, of upper division or graduate courses. Credit for undergraduate study, graduate study, and teaching, individually, or in any combination thereof, shall in no case exceed a total of four years towards meeting the requirement of at least seven years of professional geophysical work as set forth above. A maximum of 48 months of credit will be applied to any application.

Qualifying Experience:

Professional Geologist - An applicant for licensure as a Professional Geologist must have a documented record of a minimum of five years of professional geological experience of a character satisfactory to the Board, demonstrating that the applicant is qualified to assume *responsible charge* of this work upon licensure as a geologist. This experience shall be gained under the supervision of a geologist or geophysicist licensed in this or any other state, or under the supervision of others who, in the opinion of the Board, have the training and experience to have *responsible charge* of geological work. Professional geological work does not include routine sampling, laboratory work, or geological drafting. Credit will not be given for professional geological work performed under the supervision of a Professional Geologist until the applicant has completed the

educational requirements. Credit will not be given for professional geological work experience performed during the same time period when full-time graduate study or research is being done for which educational experience credit is allowed. Part-time graduate study or research and part-time professional geological work experience will be prorated and combined on a 12 calendar month basis. Unlicensed practice of geology will not be recognized as qualifying experience. It is the applicant's responsibility to ensure that all transcripts are provided to the Board.

Professional Geophysicist - An applicant for licensure as a Professional Geophysicist must have at least seven years of professional geophysical work which shall include either a minimum of three years of professional geophysical work under the supervision of a professional geophysicist, except that prior to July 1, 1973, professional geophysical work shall qualify under this subdivision if it is under the supervision of a qualified geophysicist, or a minimum of five years' experience in responsible charge of professional geophysical work. Professional geophysical work does not include the routine maintenance or operation of geophysical instruments, or, even if carried out under the responsible supervision of a professional geophysicist, the routine reduction or plotting of geophysical observations. Credit will not be given for professional geological work performed under the supervision of a Professional Geophysicist (PGP) until the applicant has completed the educational requirements. Credit will not be given for professional geophysical work experience performed during the same time period when full-time graduate study or research is being done for which educational experience credit is allowed. Part-time graduate study or research and part-time professional geophysical work experience will be prorated and combined on a 12 calendar month basis. Unlicensed practice of geophysics will not be recognized as qualifying experience. It is the applicant's responsibility to ensure that all transcripts are provided to the Board.

Certified Engineering Geologist - An applicant for certification as a Certified Engineering Geologist must have either:

- a. A minimum of three years performed under the supervision of a geologist certified in the specialty for which he is seeking certification or under the supervision of a registered civil engineer if the applicant is seeking certification as an engineering geologist, except that prior to July 1, 1970, professional geological work shall qualify under this subdivision if it is performed under the supervision of a geologist qualified in the specialty for which the applicant is seeking certification or under the supervision of a registered civil engineer if the applicant is seeking certification as an engineering geologist.

or

- b. A minimum of five years of experience in responsible charge of professional geological work in the specialty for which the applicant is seeking certification.

The applicant shall submit at least three references from qualified engineering geologists and are required to supply at least three representative engineering geologic reports prepared mainly or wholly by the applicant – one representing each year of qualifying work experience claimed. Draft submittal reports are not final products, and therefore are not representative of qualifying work.

In accordance with CCR Title 16, Division 29 §3041, an applicant must be licensed as a professional geologist in the State of California and have a knowledge of the geology of the State of California; geologic factors relating to civil engineering problems typically encountered in the State; elementary soil and rock mechanics; and principles of grading codes and other pertinent regulations.

Certified Hydrogeologist - An applicant for certification as a Certified Hydrogeologist (CHG) must have either:

- a. A minimum of three years performed under the supervision of a geologist certified in the specialty for which he is seeking certification, except that prior to July 1, 1970, professional geological work shall qualify under this subdivision if it is performed under the supervision of a geologist qualified in the specialty for which the applicant is seeking certification.

or

- b. A minimum of five years of experience in responsible charge of professional geological work in the specialty for which the applicant is seeking certification.

The applicant shall submit at least three references from qualified hydrogeologists and are required to provide at least three representative hydrogeological reports prepared mainly or wholly by the applicant – one representing each year of qualifying work experience claimed. Draft submittal reports are not final products, and therefore are not representative of qualifying work.

In accordance with CCR Title 16, Division 29 §3042, an applicant must be licensed as a professional geologist in the State of California and have knowledge of geology of the State of California; geologic factors relating to the water resources in this State; principles of groundwater hydraulics/hydrology and groundwater quality including the vadose zone; applicable federal, state and local rules and regulations; principles of water well, monitoring well, disposal well and injection well construction; elementary soil and rock mechanics in relation to groundwater, including the description of rock and soil samples from wells; and interpretation of borehole logs as they relate to porosity, hydraulic conductivity or fluid character.

Independent Evaluation of Scope, Character and Duration of Applicant's Qualifying Geologic Work Experience form - The Board requires a detailed "Independent Evaluation of Scope, Character and Duration of Applicant's Qualifying Geologic Work Experience" form to be completed by the applicant's supervisor in *responsible charge* of the applicant's *qualifying experience* as part of the application for registration and administration of the examination process. This evaluation is documented in the "Independent Evaluation of Scope, Character and Duration of Applicant's Qualifying Geologic Work Experience" form(s) to be supplied by the reference provider(s) directly to the Board.

Qualifying Experience Calculation – the following **example** demonstrates how the percentages given on the reference provider's evaluation are used to determine the number of months of qualifying experience: Item b. 36 months of work experience

- Item f. 80% of time in item b. work related to geology
 - Item g. 75% of time in item f. acting in a responsible position
- $36 \times 80\% \times 75\% = 21.6$ months of qualifying experience

Responsible Charge - Independent control and direction by the use of initiative, skill and independent judgment of geological or geophysical work or the supervision of such work.

Responsible Position - A position whereby a person having individual control and direction of a geological project exercises individual initiative, skill and judgment in the investigation and interpretation of geological features, or the supervision of such projects. An individual can be considered to be in *responsible position* even though not professional and working as a subordinate employee to a Professional Geologist (PG).

Geologists and Geophysicists Code of Professional Standards - CCR, Title 16, Division 29 §3065 specifies: To protect and safeguard the health, safety, welfare, and property of the public, and California's

environmental quality, every person who is licensed by the Board for Professional Engineers and Land Surveyors (Board) as a professional geologist or professional geophysicist, including licensees employed in any manner by a governmental entity or in private practice, shall comply with the professional standards in this section. A violation of any of the following professional standards shall constitute unprofessional conduct and shall be sufficient grounds for disciplinary action.

(a) Compliance with Applicable Law:

A licensee shall provide all geologic and geophysical services in a manner consistent with applicable laws, codes, ordinances, rules and regulations. A licensee may obtain and rely upon the knowledge and advice of other professionals (e.g., architects, attorneys, professional engineers, other professional geologists and geophysicists, land surveyors, and other qualified persons) concerning the intent and meaning of such laws, codes, and regulations.

(b) Competence:

(1) Licensed geologists or licensed geophysicists (together with those whom the licensee may engage as consultants) shall perform or offer to perform only those professional services for which they are qualified by education, training, experience, and licensure as required by law, in the specific technical and scientific areas involved.

(2) When practicing geology or geophysics, a licensee shall act with competence and reasonable care, and shall apply the technical knowledge and skill which is ordinarily practiced by licensees in good standing, practicing in this state under similar circumstances and conditions.

(a) Representations:

(1) A licensee shall not misrepresent or permit the misrepresentation of his or her professional qualifications, affiliations; or purposes, or those of the institutions, organizations or other businesses with which they are associated.

(2) A licensee may advertise or solicit those professional services for which he or she is authorized by licensure, provided such services are within his or her field of competence.

(3) A licensee shall not misrepresent his or her qualifications to a prospective or existing client or employer.

(4) A licensee shall not misrepresent to a prospective or existing client, the licensee's scope of responsibility in connection with those professional services for which the licensee is receiving or will receive compensation, whether directly or indirectly. Specifically, a licensee who represents that a project was completed under his or her responsible charge (i.e., stamped and/or signed) must also have maintained responsible charge of the work.

(5) A licensee shall only express professional opinions which have a basis in fact, are within the scope of the licensee's own experience or knowledge, and are generally accepted geologic or geophysical principles.

(6) A licensee shall attribute proper credit to others for their professional work or professional contribution, and shall not misappropriate the professional work of others.

(7) A licensee shall not knowingly permit the publication or use of his or her data, reports, maps, plans, or other professional documents for any unlawful purpose.

(8) A licensee shall not falsely or maliciously attempt to injure, impugn or, in fact injure the professional reputation or business of others.

(9) A licensee shall not misrepresent data or its relative significance in any geologic or geophysical work product or oral conveyance of his or her professional opinion.

(10) A licensee shall not misrepresent or conceal the scope of his or her professional responsibility in connection with those professional services for which the licensee is claiming any responsibility or credit, or for which the licensee is receiving any compensation.

(11) When providing information to the Board pursuant to another's application for licensure to practice professional geology or geophysics, a licensee shall accurately represent his or her knowledge of the applicant's qualifications and qualifying experience.

(d) Conflict of Interest:

(1) A licensee shall not concurrently engage in any other business, occupation or have a financial interest in any entity that may impair his or her independent judgment, objectivity; or which may create a conflict of interest in rendering his or her professional services.

(2) A licensee shall not accept compensation for his or her professional services from more than one party on any project, endeavor, or proceeding unless the circumstances are fully disclosed and agreed to in writing by all concerned parties.

(3) If a licensee has any business association or financial interest which is substantial enough to influence his or her judgment in connection with the performance of professional services, the licensee shall fully disclose in writing to his or her client(s) or employer(s) the nature of the business association or financial interest. If the client(s) or employer(s) object(s) to such association or financial interest, the licensee shall either terminate such association or interest, or offer to give up the project or employment.

(4) A licensee shall not solicit or accept payments, rebates, refunds, commissions, or compensation, whether in the form of money or otherwise from other professionals, contractors, suppliers of material, systems or equipment in return for specifying their products or professional services to a client or employer of the licensee.

(e) Confidential Information:

As used in this section, "confidential information" means all information, specifically identified as confidential by the licensee's client, employer, representative, or other related entity. Confidential information obtained by a licensee in his or her professional capacity, shall not be disclosed by the licensee without prior permission, except under the following specific conditions:

(1) disclosures made in response to a subpoena or summons enforceable by an order of a court;

(2) disclosures made in response to an official inquiry from a governmental regulatory agency;

(3) disclosures made by a licensee to another licensee to the extent necessary for purposes of professional consultation;

(4) disclosures made when required by law, code, or regulation.

(5) disclosures made upon discovery of a hazard within the licensee's field of professional expertise, which, in the licensee's professional opinion, is a threat to the health, safety and welfare of the public.

(6) disclosures made when providing evidence to the Board concerning another licensee or unlicensed individual, who may have violated any part of the Geologist and Geophysicist Act or this Section;

(7) disclosures made regarding alleged illegal conduct; or

(8) disclosures made in an adjudicatory proceeding or pursuant to an order of the court.

(f) Document Submittal

(1) A licensee shall not misrepresent the completeness of any professional geologic or geophysical document submitted to any governmental or regulatory agency.

(2) A licensee shall not misrepresent the completeness of any professional geologic or geophysical document prepared for his or her client, employer, or other involved party.

Note: Authority cited: §§7818 and 7860(c)(3), Business and Professions Code. Reference: §7860(c)(3), Business and Professions Code.